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XVI. *A new and conciſe Method of computing Intereſt at Six per Cent. per Annum.* By PHILOMATH.

LET the intereſt of £.745 be required for 16 months at 6 per cent. per annum.

Operation at large.—According to the double Rule of Three, or (as it is ſometimes called) the Rule of Five, the queſtion will be ſtated thus:

If £.100 in 12 months gain £.6, what will £.745 gain in 16 months?

For ſolution.—Of theſe five terms ſo ranged,

```
 £.      m.      £.      £.      m.
100  :   12  :   6   :   745  :  16,
```

the three laſt are to be multiplied together, for a dividend; and the two firſt for a diviſion: And the quotient will be the anſwer to the queſtion. Thus,

```
                        745
                         16
                       ----
                       4470
   100                  745
    12                -----
   ----               11920
    200                   6
   100                -----
   ----               71520 ( £.59
   1200        )      6000
                      -----
                      11520
                      10800
                      -----
            Remain.     720
                         20
                      -----
                    )14400 ( 12s.
                      1200
                      -----
                       2400
                       2400
                      -----
            Anſwer, £.59 12 0
```

If the dividend and diviſor, in the foregoing operation, be leſſened in the ſame proportion, or, like parts, be taken inſtead of their wholes, as, if one ſixth part of the former dividend be divided by one ſixth part of the former diviſor, the quotient and anſwer will be the ſame as before. But the product of the two laſt terms in the ſtating (omitting the multiplication by the third term 6) is equal to one ſixth of ſaid dividend :— Therefore, if the product of ſaid two laſt terms be divided by 200, equal to one ſixth of the former diviſor, the quotient and anſwer will be as before. Thus,

```
                   745
                    16
                  ----
                  4470
                  745
                 -----
        200 )    11920 (£.59
                 1000
                 -----
                  1920
                  1800
                 -----
     Remain.       120
                    20
                 -----
                  2400 ( 12s.
                  200
                  ----
                   400
                   400
```

If inſtead of the dividend 11920, in the laſt operation, being divided by 200, it be divided by one of the two numbers, *e. g.* 10 and 20, the rectangle whereof is equal to 200, the diviſor there, and the quotient thence ariſing be divided by the other of ſaid two numbers, the laſt quotient and anſwer will be the ſame as before. Thus,

```
10)11920 ( 1192
   10
   ——
   19
   10
   ——
    92
    90
    ——
     20
     20

20)1192(£.59
   100
   ———
    192
    180
    ———
     12s.
```

Note here.—The firſt quotient is ſhillings, it taking 20 of them in the ſecond diviſion to make a pound; and the remainder, after the firſt diviſion, (if any) expreſſes tenths of a ſhillings.

Again.—Inſtead of the former dividend, 11920, being divided by 200, if one half ſaid dividend, or, half the product of the two laſt terms of the ſtate of the queſtion, (which is equal to the product of either of the ſaid two laſt terms multiplied into half the other) be divided by half the ſaid diviſor 200, = 100, there will be the ſame quotient and anſwer as before. Thus,

```
200        11920
———        —————
100   )    5960(£.59
           500
           ———
            960
            900
            ———
Remain.      60
              20
            ————
            1200 ( 12s.
            100
            ————
             200
             200
```

From the premiſes reſult the following rules for computing intereſt at 6 per cent. per annum, in a *new conciſe method*, made uſe of by many gentlemen, but which is not commonly known.

1. If any ſum of money be multiplied by the number of months and parts of a month it is at intereſt, at the rate of 6 per cent. per annum, and the right-hand figure of the pounds in the product be ſeparated by a comma from the others, (if any be) thoſe other figures will be the ſhillings which the intereſt doth come to for the time given, and the right-hand figure, ſeparated as aforeſaid, will be the decimal, that is, the tenth part of a ſhilling.

Example. What is the intereſt of £.745, for 16 months, at 6 per cent. per annum?

Operation.

£.745
16

4470
745

20s. 119, 2, 0

Anſ. 59, 12, 0

2. If any ſum of money be multiplied by one half of the time in months and parts of a month it is at intereſt, at 6 per cent. per annum, and the two right-hand figures of the pounds in the product be ſeparated with a comma from the others, (if there be any) thoſe other figures, if any there be, will be the pounds that the intereſt doth come to for the time given; and the right-hand figure, ſo ſeparated, will be the decimal parts of a pound.

Example. What is the intereſt of £.745, for 16 months, at 6 per cent. per annum?

Operation.

$$\begin{array}{r} \pounds\cdot 745\\ 8\\ \hline 59,60\\ 20\\ \hline 12,00\\ \hline \end{array}$$

Anſ. £.59 12

If under either of theſe rules, in the product, there be no figures in the place of pounds, ſupply them by one or two cyphers. If under the ſecond rule, there be but one figure in the place of pounds, ſupply by prefixing one or two cyphers.*

The multiplication of pounds, ſhillings, pence, &c. by months and ſuch number of days as are not an exact half, third part, &c. of a month, may indeed ſometimes prove burthenſome to the mind.

But by the help of the two ſubſequent tables of decimals, one of the parts of a pound, and the other of the parts of a month, the intereſt of any ſum of money, conſiſting of divers denominations of pounds, ſhillings, pence, and even farthings, for any given number of months and days, may, upon the principles on which the ſecond rule aforegoing is founded, by an eaſy proceſs and with ſufficient accuracy, be computed.

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* In both theſe rules, the ſum at intereſt is ſuppóſed to be given in pounds, &c. But if the ſum at intereſt be given in dollars, the intereſt thereon may be computed by the ſecond rule; only obſerving, that the figures in the product, (of the ſum by half the time) on the left hand of the comma, will be dollars, and thoſe on the right hand will be the decimal parts of a dollar.

A Table of Decimal Parts of a Pound, or twenty Shillings.

ſ.	d.	q.		ſ.	d.		ſ.	d.		ſ.	d.		l.	ſ.	d.	
0	0	1	0010	3	11	1959	8	0	4000	12	1	6042	0	16	2	8084
	0	2	0021	4	0	2000	8	1	4042	12	2	6084		16	3	8125
	0	3	0031	4	1	2042	8	2	4084	12	3	6125		16	4	8167
	1	0	0042	4	2	2084	8	3	4125	12	4	6167		16	5	8209
	2	0	0084	4	3	2125	8	4	4167	12	5	6209		16	6	8250
	3	0	0125	4	4	2167	8	5	4209	12	6	6250		16	7	8292
	4	0	0167	4	5	2209	8	6	4250	12	7	6292		16	8	8334
	5	0	0209	4	6	2250	8	7	4292	12	8	6334		16	9	8375
	6	0	0250	4	7	2292	8	8	4334	12	9	6375		16	10	8417
	7	0	0292	4	8	2334	8	9	4375	12	10	6417		16	11	8459
	8	0	0334	4	9	2375	8	10	4417	12	11	6459		17	0	8500
	9	0	0375	4	10	2417	8	11	4459	13	0	6500		17	1	8542
	10	0	0417	4	11	2459	9	0	4500	13	1	6542		17	2	8584
	11	0	0459	5	0	2500	9	1	4542	13	2	6584		17	3	8625
1	0	0	0500	5	1	2542	9	2	4584	13	3	6625		17	4	8667
1	1	0	0542	5	2	2584	9	3	4625	13	4	6667		17	5	8709
1	2	0	0584	5	3	2625	9	4	4667	13	5	6709		17	6	8750
1	3	0	0625	5	4	2667	9	5	4709	13	6	6750		17	7	8792
1	4	0	0667	5	5	2709	9	6	4750	13	7	6792		17	8	8834
1	5	0	0709	5	6	2750	9	7	4792	13	8	6834		17	9	8875
1	6	0	0750	5	7	2792	9	8	4834	13	9	6875		17	10	8917
1	7	0	0792	5	8	2834	9	9	4875	13	10	6917		17	11	8959
1	8	0	0834	5	9	2875	9	10	4917	13	11	6959		18	0	9000
1	9	0	0875	5	10	2917	9	11	4959	14	0	7000		18	1	9042
1	10	0	0917	5	11	2959	10	0	5000	14	1	7042		18	2	9084
1	11	0	0959	6	0	3000	10	1	5042	14	2	7084		18	3	9125
2	0	0	1000	6	1	3042	10	2	5084	14	3	7125		18	4	9167
2	1	0	1042	6	2	3084	10	3	5125	14	4	7167		18	5	9209
2	2	0	1084	6	3	3125	10	4	5167	14	5	7209		18	6	9250
2	3	0	1125	6	4	3167	10	5	5209	14	6	7250		18	7	9292
2	4	0	1167	6	5	3209	10	6	5250	14	7	7292		18	8	9334
2	5	0	1209	6	6	3250	10	7	5292	14	8	7334		18	9	9375
2	6	0	1250	6	7	3292	10	8	5334	14	9	7375		18	10	9417
2	7	0	1292	6	8	3334	10	9	5375	14	10	7417		18	11	9449
2	8	0	1334	6	9	3375	10	10	5417	14	11	7459		19	0	9500
2	9	0	1375	6	10	3417	10	11	5459	15	0	7500		19	1	9542
2	10	0	1417	6	11	3459	11	0	5500	15	1	7542		19	2	9584
2	11	0	1459	7	0	3500	11	1	5542	15	2	7584		19	3	9625
3	0	0	1500	7	1	3542	11	2	5584	15	3	7625		19	4	9667
3	1	0	1542	7	2	3584	11	3	5625	15	4	7667		19	5	9709
3	2	0	1584	7	3	3625	11	4	5667	15	5	7709		19	6	9750
3	3	0	1625	7	4	3667	11	5	5709	15	6	7750		19	7	9792
3	4	0	1667	7	5	3709	11	6	5750	15	7	7792		19	8	9834
3	5	0	1709	7	6	3750	11	7	5792	15	8	7834		19	9	9875
3	6	0	1750	7	7	3792	11	8	5834	15	9	7875		19	10	9917
3	7	0	1792	7	8	3834	11	9	5875	15	10	7917		19	11	9959
3	8	0	1834	7	9	3875	11	10	5917	15	11	7959	1	0	0	10000
3	9	0	1875	7	10	3917	11	11	5959	16	0	8000				
3	10	0	1917	7	11	3959	12	0	6000	16	1	8042				

A Table of Decimal Parts of a Month.

Days.		D.		D.		D.		M.D.	
1	0333	7	2333	13	4333	19	6333	25	8333
2	0667	8	2667	14	4667	20	6667	26	8667
3	1000	9	3000	15	5000	21	7000	27	9000
4	1333	10	3333	16	5333	22	7333	28	9333
5	1667	11	3667	17	5667	23	7667	29	9667
6	2000	12	4000	18	6000	24	8000	1 0	1,0000

When intereſt at the rate of 6 per cent. per annum, is to be computed on any given ſum of money and for any given time, and the money or time, or both, be of divers denominations, ſet down the money at intereſt in pounds and decimal parts of a pound, and the time in months and decimal parts of a month, (the decimals being taken from the tables reſpectively) and multiply the whole of one of them by half of the other, and count off two more of the right-hand figures of the product than there are places of decimals in the multiplicand and multiplier together, and there place a comma, to ſeparate them from the other figures of the product, if any be; but if there be not ſo many figures in the product, ſupply them by prefixing cyphers; and then the figures (if there be any) on the left hand of the comma, will be the pounds that the intereſt comes to for the given time; and the figures on the right hand of the comma will be decimal parts of a pound,—three or four of which, next the comma, may be ſufficient in common caſes to retain, and the reſt may be expunged.

Example. Let the intereſt of £.745 15s. 6d. for 1 year 7 months and 11 days, at 6 per cent. per annum, be computed.

Money.	M. Time.
£.745, 775	2)19, 3667
9, 6833	
	9, 6833
2237325	
2237325	
5966200	
4474650	
6711975	
72,2156	
20	
4,3120	
12	
3,6440	
4	
2,5760	

Anſ. £.72. 4s. 3d. 2q.

This method is adapted to reckoning intereſt at the rate of 6 per cent.—But from the intereſt at 6 per cent. the intereſt at any other given rate may be obtained, as follows :

One *ſixth* part of the intereſt at 6 per cent. is the intereſt at 1 per cent.—One *third* is the intereſt at 2 per cent.—One *half* is the intereſt at 3 per cent. If from the intereſt at 6 per cent. there be ſubtracted one *third* of it, the remainder will be the intereſt at 4 per cent.—If one *ſixth* be ſubtracted, the remainder will be the intereſt at 5 per cent.

Again.—If to the intereſt at 6 per cent. there be added one *ſixth* part thereof, the ſum will be the intereſt at 7 per cent.—If there be added one *third*, the ſum will be the intereſt at 8 per cent.—If there be added *half*, the ſum will be the intereſt at 9 per cent.—If two *thirds*, the ſum will be the intereſt at 10 per cent.—If one *half* and one *third*, the ſum will be the intereſt at 11 per cent.—The double of the intereſt at 6 per cent. is the intereſt at 12 per cent.—If to that double there be added one ſixth of the intereſt at 6 per cent. the ſum will be the intereſt at 13 per cent. &c.

And this diviſion, addition or ſubtraction may be made immediately after the firſt operation of multiplying the money at intereſt by half the time, or *è contra*, and before the ſeparating the figures into pounds and decimals.

Example. Let there be computed the intereſt of £.480, for 7 months and 15 days, at 5 per cent. per annum.

M.
£.480, 7, 50
3,75
3, 75
2400
3360
1440
180000 at 6 per cent.
30000 $\frac{1}{6}$ deduct.
15,0000 at 5 per cent.
Anſ. £.15.

Example. Let the intereſt of £.345 15s. for 9 months and 6 days, be computed, at the rate of 7 per cent. per annum.

£.345,75 9,20
4, 60
4,60 half the time.
2074500
138300
15904500 at 6 per cent.
2650750 $\frac{1}{6}$ add.
18,565250 at 7 per cent.
20
11,305000
12
3,660000
4
2,640000
Anſ. £.18 11s. 3d. 2q.

Let it be obſerved here,—in this proceſs as well as others, where there are decimals of a pound to be valued, there is no need of the ſeveral multiplications by 20, 12 and 4 for that purpoſe : But the preceding table of decimal parts of a pound being calculated to four places, if we repair to that with ſo many of the decimals (next the comma) to be valued, we ſhall there find their value, by inſpection.

May 15, 1781.

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